SURGEON-MAJOR G. C. WALLICH, M.D.

THERE passed away in his eighty-fourth year, at Nottingham Place, Marylebone, on March 31, George Charles Wallich, L.R.C.S. Ed., Surgeon-Major on the Retired List of Her Majesty's Indian Army; and in his decease zoology has lost an honest devotee whose work has left its impress on the progress of the science. He was the eldest son of Nathaniel Wallich, F.R.S., Knight of the Royal Danish Order of Dannebrog, distinguished during the early half of the century for his work on Indian botany, he being superintendent of the Botanic Gardens, Calcutta, where G. C. Wallich was born in November 1815. He was educated at Beverley in Yorkshire, at Reading Grammar School, and at King's College, Aberdeen, and the Edinburgh University, where he graduated M.D. in 1836, becoming the following year a Licentiate of the Royal College of Surgeons of that city. In 1838 he entered the Indian Army, and served as assistant-superintending surgeon in the Sutlej Campaign, and in 1847 he went through the Punjab wars, receiving the medal in commemoration of each. Eight years later he acted as field-surgeon during the Sonthal Campaign; and, invalided home in 1857, he two years afterwards settled at Guernsey, and afterwards at Kensington.

His scientific career dates from 1844, in which year he produced a paper dealing with "Some experiments tending to prove that the venous circulation is dependent on a vital act." His period of active and most continuous investigation, however, dates from the years 1858 to 1883, and his forty-eight papers produced during that time mostly deal with important questions of structure and distribution of the Protozoa, and allied organisms especially conspicuous in the leading topics in the marine biology of the time. Those which remain were devoted to the allied consideration of questions bearing on the formation of the sedimentary deposits formed by the lower organisms in both passing and past periods of the world's history, with here and there an occasional departure into the higher groups of animals. It was in the year 1860 that Wallich started upon the line of inquiry by which his authority was established. Being recommended by Sir R. Murchison and Huxley for the post of naturalist to H.M. *Bulldog*, about to survey the ground for the North Atlantic cable between Great Britain and America, he sailed under command of Sir F. L. McClintock, R.N., in June 1860, returning to London in November of that year. As the result of this voyage, he was the first to demonstrate that ocean depths below 1000 fathoms were actually inhabited. The facts concerning temperature, pressure, and the general conditions at these depths at the time known and surmised had led to the belief that animal life was thereat impossible, and Wallich, in proving the contrary, laid the foundations of our modern deep-sea research. Working out the soundings obtained during this memorable voyage, he later published the first part of a projected book, entitled "The North Atlantic Sea Bed," by which he became famous. Although never completed, this will remain a standard work in the literature of deep-sea investigation, and a lasting testimony to its author's acumen and powers of observation. While most fascinated by the geographical and lithological aspects of his task, Wallich was by no means neglectful of the more purely biological, and of the structure and physiological manifestations of the individual organism. Contemporary of the elder Carpenter, of Allman, and others who early in the latter half of the present century essayed the pioneer's task of unravelling the mysteries of life as revealed in their essence by the unicellular organism, his contributions towards the determination of the excretory nature of the contractile vacuole, and his attempt, at a period at which our micro-chemical methods were in their infancy, to differentiate the nucleus by means of an electric discharge, will always be interesting chapters in the history of physiological inquiry. Trenchant in his literary style, prone to discussion, we find him in controversy with his contemporary workers—conspicuously as concerning his views upon the "Bathybius," which Huxley, in later years, admitted his "bogey," and the Coccospheres, upon which recent investigation has proved his views to have been largely sound. He did well in his time, and his work will endure.

While neither distinction nor special recognition were meted out to him during the active years of his life, he was in 1898 awarded the Gold Medal of the Linnean Society of London, "in recognition of his researches into the problems connected with bathybial and pelagic life." He was an Hon. Fellow of the Microscopical Society, and a Corresponding Member of the Royal Society of Liége.

NOTES.

IT is announced that, in accordance with the amended Standard Time Act, Adelaide time was advanced half an hour at midnight on Sunday.

WE learn from the *Astronomische Nachrichten* that the Fürstlich Jablonowskisebe Gesellschaft offers for 1902 a prize of 1000 marks for an essay bearing on Poincaré's investigations of Neumann's method of the arithmetic mean. The scope of the essays is defined by the society as follows:—That the investigations contained in Poincaré's work of 1896, entitled "La méthode de Neumann et le problème de Dirichlet," might be materially developed in some direction or other.

PARTICULARS concerning the work of the Belgian Antarctic Expedition have been given to the Brussels Geographical Society by Lieut. Gerlache, commander of the expedition. The *Times* gives the following summary of Lieut. Gerlache's report: The expedition left St. John's Bay on January 14, 1898, and on the 21st explored the South Shetland Islands. On January 15, in 55° 5′ south latitude and 65° 19′ west longitude, soundings to the depth of 4040 metres were taken. The *Belgica* left on the 23rd for Hughes Bay, discovering a strait separating the lands of the east from an unknown archipelago. The land to the east was named Danco Land. Magnetic observations were made and interesting botanical, geological, and photographic results were obtained. On February 13 the *Belgica* went in the direction of Alexander I. Land, exploring the belt of bank ice towards the west. On March 10 the ship became fast in the ice in latitude 71° 34′, longitude 89° 10′. The sun disappeared on May 17, and there was continual night until July 21. M. Danco died on June 5, and his remains were deposited in a tomb of ice. The *Belgica*, after leaving her winter quarters, again became fast in the ice in 103° west longitude. She reached open water on March 14. The expedition made successful magnetic and meteorological observations, and obtained collections of pelagic and deep-sea fauna and samples of submarine sediments. On February 26 Black Island was explored, and on the following day the *Belgica* entered the Cockburn Channel, arriving at Punta Arenas, in Patagonia, on March 28.

AT the annual meeting of the members of the Royal Institution held on Monday, the Duke of Northumberland, President, presiding, it was announced that next month the Institution will complete one hundred years of its existence, the first meeting of its members in the building in Albemarle Street having been held on June 5, 1799. The managers have decided that this event, so interesting and memorable in the life of the Institution and in the history of science in this country, shall be duly celebrated.

They have, therefore, arranged for the delivery of two Commemoration Lectures. The first of these lectures will be delivered at three o'clock on Tuesday, June 6, by Lord Rayleigh, when His Royal Highness the Prince of Wales, Vice-Patron of the Institution, will preside and receive the honorary members; the second of these lectures will be delivered at nine o'clock on Wednesday evening, June 7, by Prof. Dewar, when His Grace the Duke of Northumberland, President of the Institution, will preside. It was further announced that the Lord Mayor has consented to give a reception to the members, foreign guests, and representative men, at the Mansion House, on the evening of Tuesday, June 6.

In a brief reference to the recent scientific work of the Royal Institution, Prof. Dewar announced on Monday that having obtained liquid hydrogen in considerable quantity, he has directly determined its temperature and other physical constants, finding its boiling point to be much lower than was previously supposed, namely 20° above the zero of absolute temperature, and attaining by exhaustion a temperature of only 15° absolute. Pending the discovery in quantity of some yet lighter gas, there are no means within sight of bridging this gap and reaching the zero point. Prof. Dewar also took occasion to give a warning against the exaggerated accounts of the properties of liquid air, which, originating in America, have found their way into popular magazines in this country.

The Trustees of the National Portrait Gallery have received, under the will of the late Colonel John Barrow, F.R.S., formerly of the Admiralty, a bequest of a series of portraits, painted for Colonel Barrow by Mr. Stephen Pearce, relating to the various expeditions in search of Sir John Franklin. The portraits comprise a large portrait-group representing "The Arctic Council" "discussing a plan of search for Sir John Franklin"; four large half-length portraits, representing Sir Robert McClure, Sir Leopold McClintock, Captain Penny, and Sir George Nares, each in the dress worn by him in the Arctic regions; fifteen small portraits of Sir Richard Collinson, Sir Henry Kellett, Sir Edward Belcher, Sir Edward Inglefield, Dr. John Rae, Captain Rochfort-Maguire, Captain J. E. Moore, Dr. Robert McCormick, Lieut. J. Stewart, Lieut. Bellot, Sir Horatio T. Austin, Admiral Sherard Osborn, Dr. William Kennedy, Sir Leopold McClintock, and Sir Erasmus Ommanney.

The Report of the Council of the Zoological Society, read at the seventieth anniversary meeting held on Friday last, stated that the number of Fellows on December 31, 1898, was 3185, showing an increase of twenty-seven during the past year, and that the number of Fellows on the roll of the Society was in excess of what it had been in any year since 1885. The principal new buildings erected in the Society's Gardens in 1898 were the Fellows' tea pavilion, the new llama-house, and the new zebra-house, all of which are well adapted to the purpose for which they were intended. The number of visitors to the Gardens was 710,948. The number of animals living in the Gardens at the end of the year was 2656, of which 818 were mammals, 1363 birds, and 475 reptiles and batrachians. Dr. John Anderson, F.R.S., Mr. W. E. de Winton, Dr. Charles H. Gatty, Sir Hugh Low, G.C.M.G., and Dr. Henry Woodward, F.R.S., were elected into the Council in the place of the retiring members, and his Grace the Duke of Bedford and Mr. Edward N. Buxton, elected into the Council since the last anniversary, were re-elected; also Sir William H. Flower, K.C.B., F.R.S., was re-elected President, Mr. Charles Drummond, Treasurer, and Dr. P. L. Sclater, F.R.S., as Secretary.

At the annual general meeting of the Institution of Civil Engineers, held on April 26, Mr. W. H. Preece, C.B., President, in the chair, the result of the ballot for the election of officers was declared as follows:—President, Sir Douglas Fox; vice-presidents, Mr. James Mansergh, Sir William White, K.C.B., Mr. Charles Hawksley, and Mr. John Clarke Hawkshaw; other members of Council, Mr. James Barton (Dundalk), Mr. Horace Bell, Sir Alexander Binnie, Dr. Henry Taylor Bovey, Mr. T. Forster Brown, Mr. W. R. Galbraith, Mr. George Graham, Mr. G. H. Hill, Mr. J. C. Inglis, Mr. Alexander Izat, Dr. Alex. B. W. Kennedy, F.R.S., Sir James Kitson, Bart., Mr. Anthony George Lyster, Mr. John Allen McDonald, Mr. E. Pritchard Martin, Mr. William Matthews, Sir Guilford Molesworth, K.C.I.E., Sir Andrew Noble, K.C.B., Mr. Alexander Siemens, Mr. Thomas Stewart, Mr. John I. Thornycroft, F.R.S., Mr. William Thwaites, Mr. F. W. Webb, and Sir E. Leader Williams.

The Royal College of Surgeons of England has unsuccessfully appealed against the decision of the Court of Queen's Bench upon the subject of its liability to property duty in respect of part of the property held by it for the public objects of the institution. A strong protest is made against this result in the *Lancet*. It is pointed out that the College is a body incorporated by Royal Charter, the object being the "benefit of the common weal of this kingdom by the promotion of the art and science of surgery and the due promotion and encouragement of the study and practice of the said art and science of surgery." To the attainment of this object all its funds are legally appropriated and actually applied; nevertheless, the courts have decided to exclude the College from the benefits of an exception created by the Act of Parliament in favour of "any property legally appropriated and applied for . . . the promotion of science." The decision distinguishes between the museum and the library in Lincoln's Inn, and while it protects the museum as being devoted to the promotion of the science of surgery, the library is regarded as for the private convenience or advantage of the members of the College. The *Lancet* points out that eight or nine years ago the question arose as to whether the Institution of Civil Engineers was, in circumstances almost precisely parallel to those of the Royal College of Surgeons at the present day, liable to the same duty. Fortunately for that institution, the House of Lords held that applied science, no less than the pure sciences, fell within the meaning of the Act, and sustained the claim to exemption in spite of the professional eminence and social success of its members. The Royal College of Surgeons is less fortunate in its present situation.

The death is announced of Dr. C. Brongniart, Paris, distinguished by his entomological works, and more especially by his memoir on fossil insects of the Primary period.

According to a despatch from St. Louis a very destructive cyclone swept over Kirksville, Missouri, on Thursday last. The storm broke about 6.30 p.m. with great fury, sweeping a path a quarter of a mile broad through the eastern portion of the town, four hundred buildings being demolished. Heavy rain followed, accompanied by intense darkness.

Dr. Ludwig Büchner, of Darmstadt, the author of "Kraft und Stoff" (1855), a work which did much to popularise scientific materialism in Germany, died on Monday, at seventy-five years of age. Dr. Büchner was one of the most meritorious popularisers of natural science in Germany, and greatly assisted in diffusing a knowledge of the Darwinian theories in the Fatherland.

The death is announced of Mr. Charles Leeson Prince, of Crowborough, Sussex, whose meteorological work has on several occasions been referred to in these columns. Mr. Prince was a member of the Royal College of Surgeons, and a licentiate of the Society of Apothecaries. For many years he had taken great interest in all questions relating to meteorology. He was a Fellow of the Royal Astronomical and of the Meteorological Societies, and a member of the Scottish Meteorological Society, and the author of several papers on the meteorology of Uckfield and Crowborough Hill.

MR. AKERS-DOUGLAS, M.P., the First Commissioner of Works, speaking at Whitstable-on-Sea on Thursday last, referred to the favourable reports by the medical inspectors on the Whitstable oyster beds, and said that the promised legislation has not been forgotten. The President of the Local Government Board, with a desire to set at rest the fears regarding the eating of oysters, and to protect a *bona-fide* industry, is about to introduce a measure providing for the inspection of oyster layings, prohibiting removal from insanitary grounds, and regulating the importation of foreign oysters from suspected districts.

REUTER reports that the President of the Geographical Society at Christiania has received a letter from M. Borchgrevink, dated Cape Adair, Victoria Land, February 28, in which he says:—"I have now landed on the great Australian continent with staff, instruments, and seventy-five dogs. The greatest discipline has prevailed throughout."

FROM the current number of the U.S. *Monthly Weather Review* (for December last) we learn that the important decision has been taken of correcting all the published barometrical values for gravity from January 1, 1899. This change has been found necessary owing to the recent extensions of the Weather Bureau in the West Indies and along the South American coast. The reduction to standard temperature has been practised for the last sixty years, but the reduction to standard gravity has been applied only in special cases; and although the amount of the correction is now usually stated at the head of meteorological tables in the same way as the latitude and longitude and height above sea-level, the general application of the correction to the individual readings has been delayed until a concert of action among all nations could be arrived at. Its importance, however, has been recognised by various meteorological conferences. In the latitude of London the correction to standard gravity of latitude 45° amounts to about + ·02 inch.

THE Report of the Kew Observatory Committee of the Royal Society has been published for the year 1898. In the section referring to terrestrial magnetism, it is stated that two magnetic storms, or periods of considerable disturbance of the needles were registered, viz. on March 14-15 and on September 9-10. The first storm was the largest recorded since August 1894, and both were presumably associated with the aurora simultaneously seen in the British Isles. One of Prof. J. Milne's seismographs, intended to measure the tilting of the ground along an east-west line, was erected in the early part of the year. The largest tremors were recorded on June 29, August 31, and November 17. Among the experimental work carried on during the year may be specially mentioned that relating to atmospheric electricity, aneroid barometers, and platinum and mercurial thermometry. The verification of instruments of various kinds has steadily increased, the number tested during the year exceeding 24,000. Although the number of watches sent for trial was less than in the previous year, the high standard referred to in previous reports has been maintained. During the year, various schemes have been promoted in connection with electric tramways in the neighbourhood of the observatory. The Committee state that whilst everything has been done, as far as can be foreseen, to protect the magnetographs, it is impossible to contemplate the future without some misgivings. The proposed establishment of a National Physical Laboratory will, in all probability, greatly extend the usefulness of the Kew Observatory; the arrangements were not completed before the close of the year 1898.

THE members of the German Deep Sea Expedition arrived in Hamburg on Saturday, on board the *Valdivia*, after nine months' absence. They were welcomed (the *Times* reports) by the Imperial Secretary of State for the Interior, Count von Posadowsky, the Saxon Minister of Education, Baron von Seydewitz, Prof. Drygalski, who will be the leader of the German Antarctic expedition, and a large number of the representatives of the scientific world. At a banquet given in the dining-hall of the offices of the Hamburg-American Line, Count Posadowsky welcomed the members of the expedition in a speech in which he referred to the interest manifested by the Emperor in the expedition and in all seafaring projects. This was not due solely to his Majesty's personal inclinations, but resulted from his profound recognition of the importance of these subjects for the future of Germany. A telegram was read in which the Emperor expressed his satisfaction at the success of the expedition.

DR. R. H. SCOTT, F.R.S., gives in the *Quarterly Journal of the Royal Meteorological Society*, dated January 1899 and just issued, a translation of the important paper on the diurnal oscillation of the barometer, contributed by Dr. Julius Hann to the *Meteorologische Zeitschrift* for October 1898. Meteorologists unfamiliar with the German language will be glad to have this English version of Dr. Hann's contribution to the theory of the daily barometric oscillations.

AS an indication of the character of the season, Mr. W. Baylor Hartland, writing from Cork, says his son saw swallows on Wednesday last, April 26, at Ard-Cairn. On Thursday he himself saw a pair of corncrakes nestling among some daffodil beds. Mr. Hartland adds: "If this had occurred in a field of rye, wheat, rye-grass, or vetches, I should not have noticed it. But for the birds to nestle within the foliage of broad plantations of daffodils, planted for commercial purposes in Ireland, never before happened in the Green Isle. I have grown them for eighteen years, but the foliage this year is so luxuriant, I suppose the birds were attracted by its shelter."

A PARLIAMENTARY Return just issued shows that between the date of the passing of the Vaccination Act on August 12 and December 31, 1898, the number of certificates of conscientious objection received by the vaccination officers was 203,413, and that the number of children to whom such certificates related was 230,147.

IT is stated by the *Allgemeine Militär-Zeitung* that the aluminium steerable balloon invented by Count Zeppelin will very probably make its first ascent at the beginning of July. The ascent will take place above Lake Constance. In order that the balloon may rise clear of trees and buildings, a platform has been built in the lake on pontoons, at about 700 metres from the shore, where the apparatus for raising the balloon will be placed.

IN a paper on the treatment of refractory silver ores by lixiviation, read by Mr. Breakell at a recent meeting of the Institution of Mining Engineers, some results are given which bear strong testimony to the value of Russell's modification of the hyposulphite process. Experiments are described proving that the presence of only 0·2 per cent. of copper increases the volatilisation loss of silver in chloridising roasting. In one case the loss was raised from 0·5 to 3·6 ounces of silver per ton by the addition of this amount of copper. On the other hand, metallic silver and sulphide of silver, which are always present, especially in badly roasted charges, are readily dissolved by hyposulphite solutions containing copper, though not rapidly acted on in its absence. It follows that the presence of copper should be avoided in the furnace charge, and that it may be added with advantage in the later stages of the process.

THE old view that insects, with all the lower animals, were created for man's benefit cannot reasonably be held at the present time, but it must, nevertheless, not be forgotten that there are very many beneficial as well as injurious insects. Dr. L. O. Howard has recently summed up the good and bad qualities of insects so far as it is possible to do, and he finds that the insects of 116 families are beneficial, and the insects of 113 families are injurious, while those of 71 families are both beneficial and harmful or their functions have not been determined. The injurious insects are made up of 112 families which feed upon cultivated or useful plants, and one family the members of which are parasitic upon warm-blooded animals. Of the beneficial insects, those of 79 families are valuable as preying upon other insects, 32 families are of service as scavengers, two families as pollenisers, and three families as forming food for food fishes.

PROF. F. E. SCHULZE, of Berlin, the general editor of the important new German work, "Das Tierreich," which is in course of publication by Messrs. R. Friedländer and Son, has obtained the services of Prof. Kretschmer, of Marburg, for the preparation of a series of rules for the formation and pronunciation of zoological and botanical names upon classical and orthodox principles. These rules seem to be excellent in every way, and will, we trust, be strictly followed by the numerous contributors to "Das Tierreich." In America, we regret to say, a small school of zoologists has arisen who prefer to spell and pronounce names *in*correctly, following literally the mistakes often made by their original propounders. This pestilent heresy has, we are glad to say, not met with much support in Europe, and we hope that Prof. Kretschmer's rules will assist in suppressing it.

IN the "Report of the Entomological Department of the New Jersey Agricultural College Experiment Station for the year 1898," Dr. John B. Smith calls attention to the interesting and perhaps important fact that the San José scale now begins breeding later than when it first came under his observation, and that the rate of increase before midsummer is materially less than in the past, the period of greatest increase being now in September. It is evident that the introduced pest is endeavouring to accommodate itself to its new surroundings, and it will be interesting to see whether it succeeds or fails. If it fails, its automatic extinction will be a mere matter of time, though it is quite possible that it may be capable of producing a great amount of harm before that time arrives.

A RECENT number of the *Cape Agricultural Journal* contains a report of an address given by Dr. Edington on the artificial use of a particular fungus, said to be parasitic to locusts, for the destruction of the latter. The results so far obtained with the fungus in question appear to be at considerable variance, some farmers stating that they have derived great benefit from its application, whilst others assert as positively that it has been of no use whatever. A great deal must of necessity depend upon the circumstances in which this, together with other such similar living-destroying agencies, are employed, and Dr. Edington, in the course of his lecture, pointed out what he considered the best methods for promoting the successful use of this fungus. If locusts can be destroyed in so simple a manner as this is described to be, the gain to the Cape farmers will be enormous, and at any rate means should be adopted so that its use may become more widely known, and more extensive trials given to it. The use of fungi for the destruction of pests is being tried in America, where the white muscardine fungus, *Sporotrichum globuliferum*, has been largely employed during the last few years to check the injurious over-production of the chinch-bug. Mr. Benjamin Duggar, of the Cornell Agricultural Experiment Station, has, however, been recently making a careful study of this organism in relation to the insect in question, and has come to the conclusion that, although it is undoubtedly parasitic at times, it is not sufficiently efficient to enable it to be artificially employed with economic success. It is obvious that to obtain trustworthy data on this subject, many and very carefully conducted investigations must be carried out. It is to be hoped that Dr. Edington will be able to give the locust-problem the time and attention which it requires to enable scientific conclusions to be drawn as to the economic value of the fungus he recommends in destroying locusts.

THE current number of the *Journal of the Sanitary Institute* continues the reports of papers read at the congress held in Birmingham last year. Amongst them we note a useful little address given by Dr. Mary D. Sturge in the Section devoted to domestic hygiene, entitled "The Claims of Childhood." Whilst emphasising the responsibilities of parents towards their offspring, the writer also points out the necessity of our following the example of France in getting legislative measures directed towards checking the growing use of tobacco amongst young boys. In Norway only last year, it appears, stringent laws were passed forbidding the sale of tobacco to lads under sixteen, and prohibiting their smoking in the streets. Although the municipal authorities in most of our large crowded cities are alive to the duty of modifying as far as possible the unfavourable conditions under which children are of necessity reared, yet much remains still to be done. Dr. Sturge, amongst other matters, calls attention to the smoke-nuisance, and indulges in the hope that some day legislative steps will be taken whereby it will be controlled, and incidentally tells us that in the Tudor period a law existed ordering Londoners to burn nothing but wood during the time that Parliament was sitting, in order that the health of the country squires who came to town might not be impaired!

MR. WILLIAM H. DALL has prepared a useful table of the North American Tertiary horizons, correlated with one another and with those of Western Europe (Eighteenth Annual Report of the U.S. Geological Survey, 1898).

THE geology of the eastern part of Texas, with reference to the artesian wells, forms the subject of an essay by Mr. Robert T. Hill and Mr. T. Wayland Vaughan (Eighteenth Annual Report of the U.S. Geological Survey).

MM. E. PIETTE and J. de la Porterie describe some prehistoric remains from excavations at Brassempouy, south-east of Dax, Department of Landes. Drawings on bones and various finely-worked implements are figured (*L'Anthropologie*, Paris, tome ix.).

THE Triassic formation of Connecticut is very fully discussed by Prof. William M. Davis (Eighteenth Annual Report of the U.S. Geological Survey). He treats the subject from three points of view—deposition, deformation, and denudation. The formation comprises a great series of sandstones and shales, with local conglomerates; and it includes in the central division great sheets and dykes of volcanic rock. In mass the formation is of "continental" as opposed to marine origin.

THE origin of peneplains is discussed by Prof. W. M. Davis in an article in the *American Geologist* for April. The article is in the main a reply to criticisms by Prof. Tarr. It is maintained that the prolonged results of both marine abrasion and subaërial denudation tend to reduce the land to a base-level (or peneplain)—a nearly featureless plain, a little below or a little above sea-level. It is admitted, with regard to ancient plains of denudation, that in many instances there seems to be no way of determining how much work was done by the sea, and how much had been previously done by rivers, rain, and similar agencies.

"THE Alkali Soils of the Yellowstone Valley" forms the subject of an essay by Messrs. M. Whitney and T. H. Means (U.S. Department of Agriculture, *Bulletin* No. 14, 1898). In the Western States of America, any excessive accumulation of soluble mineral salts in the soil is popularly spoken of as "alkali." These salts include sodium carbonate, sulphate and chloride, magnesium sulphate and chloride, and occasionally some of the borates. They may be traced to the sandstones, shales, and slaty rocks from which the soils have been derived. Before irrigation was introduced, the salts were present in rather large amounts, but they were well distributed throughout the soil, and not in such large quantities as to be injurious to crops. The injury is due entirely to over-irrigation, and may, in the authors' opinion, be easily remedied.

WE learn from the *Botanical Gazette* that the University of Texas has established a distinct department of botany, which will begin its separate existence with the next college year. The new department will be placed under the charge of Dr. W. L. Bray.

MR. F. J. HANBURY and Rev. E. S. Marshall announce for early publication their long-promised "Flora of Kent," which has been twenty years in preparation. From its variety of soil, its geographical position, and its extended sea and river coast, this will be one of the most interesting and richest county floras of England. There will be two maps, one showing the divisions of the county, and the other coloured geologically; and in the introduction, devoted to the topography of the county, there will be sections assigned to geology and meteorology.

THE study of natural history has been greatly stimulated in this country by the meetings, the excursions, and the publications of local societies. We have before us the *Irish Naturalist* for April, with a paper on the botany of the Great Central Plain of Ireland, by Mr. R. Ll. Praeger, and the conclusion of one on the Brachiopoda and Mollusca of the carboniferous rocks of Ireland, by Dr. A. H. Foord; also the *Halifax Naturalist* for April, containing a paper on the crocus leaf, by Mr. C. E. Mass, and one on the Halifax fish fauna, by Mr. E. D. Wellburn, as well as an instalment of Mr. W. B. Crump's flora of Halifax.

AMONG the more interesting articles in the *Journal of the Royal Horticultural Society* for April is an account of a visit to Naina Tal, Kumaon, the summer residence of the Lieut.-Governor of the North-West Provinces of India; and one on the Botanical Garden at Padua, founded in 1545, and said to be the oldest in the world. It contains some trees of remarkable antiquity, one of *Vitex agnus-castus*, 349, one of *Chamaerops humilis*, 314, and one of *Platanus orientalis*, 219 years old; besides a number that have more than completed the century. Several of these are figured. There is a specimen of *Salisburia adiantifolia*, 148 years old, in which grafts from the female have been inserted on the original male plant, so that it produces both male and female flowers.

MR. BERNARD QUARITCH has published a catalogue containing descriptions of 1781 works of geography, voyages, travels, history of America, Africa, Australasia and Asia, and of books on the languages of America, Africa, and Oceanica, offered for sale by him.

THE fourteenth part of Mr. Oswin A. J. Lee's "Among British Birds in their Nesting Haunts" (Edinburgh: David Douglas) contains ten magnificent plates illustrating the nests of the turtle-dove, barn owl, reed warbler, tree sparrow, stone curlew, partridge, tufted duck, jay, and kingfisher.

FOUR different kinds of species are considered by Mr. O. F. Cook in the *American Naturalist*; they are enumerated as follows: (1) The phylogenetic species, a division or section of a line of biological succession; (2) the insular or segregated species, the living end of a line of the preceding category; (3) the incipient species, preferably known as a sub-species; (4) the artificial species, the result of man's interference in nature. Mr. Cook considers that the designation "species" should be reserved for its original use with the second of these categories, and the use of the popular designation "variety" should be restricted to the fourth. He criticises classification according to "amount of difference," and points out that with this as the only criterion, "fossils, geographic races, and artificially produced varieties are being catalogued miscellaneously and indiscriminately as species."

IN a note communicated to the *Atti dei Lincei*, viii. 5, Dr. A. Pochettino describes the results of certain observations made with acoustic resonators with a view of determining in what manner the modulus of decay is affected: (1) by varying the shape of the aperture, keeping its area constant; (2) by furnishing the aperture with flanges of various sizes; (3) by varying the distance between the resonator and the excitor. Dr. Pochettino finds that by increasing the diameter of the flange the modulus of decay diminishes; or, in the first place, the resonator becomes more capable of reinforcing vibrations of its own period, and at the same time becomes less sensitive to vibrations slightly differing in period, in the second place, the vibrations, when once excited, last longer. The modulus of decay also decreases when the distance between the excitor and resonator is increased. In experimenting with elliptic and circular apertures, the moduli of decay were found to be very nearly equal.

THE second volume of the second edition of Prof. H. Weber's masterly "Lehrbuch der Algebra" has just been published by Messrs. F. Vieweg and Son, Brunswick. The two original volumes have already been reviewed in detail in NATURE (vol. lv. pp. 25 and 481, 1897), so it is unnecessary to do more than announce the completion of the second edition of this standard treatise.—The third edition of "Premiers principes d'Electricité industrielle," by M. Paul Janet, has been published by Messrs. Gauthier-Villars, Paris. The original work contained the substance of lectures delivered in Grenoble in 1892, under the auspices of the municipality of that city. So many advances have taken place in applied electricity since the lectures were given that a number of alterations and additions have been necessary in order to bring the volume up to date.—Mr. William Schooling has revised and extended "Inwood's Tables of Interest and Mortality, for the Purchasing of Estates and Valuation of Properties," and Messrs. Crosby Lockwood and Son have just published the new edition (the twenty-fifth) containing extensive additions made by him. The whole work appears to have been very carefully revised, and it now forms an instructive as well as serviceable collection of tables. A table of logarithms of natural numbers has been introduced, and also M. Fédor Thoman's logarithmic tables of compound interest and annuities. From the point of view of practical mathematics, the new edition of "Inwood" is distinctly in advance of the former issues.

THE additions to the Zoological Society's Gardens during the past week include a Feline Dourocouli (*Nyctipithecus vociferans*) from South Brazil, presented by Mrs. Firman; a Common Raccoon (*Procyon lotor*) from North America, a Pine Marten (*Mustela martes*), British, presented by Master Eric Mellin; an Indian Pigmy Goose (*Nettopus coromandelianus*, ♂) from India, presented by H.G. the Duke of Bedford; three Ostriches (*Struthio camelus*, 3 ♀) from Lagos, presented by Mr. G. F. Abadie; a Macqueen's Bustard (*Houbara macqueeni*) from

Western Asia, presented by Mr. B. T. Ffinch; two Double-banded Sand-Grouse (*Pterocles bicinctus*) from Senegal, a Lesser Pin-tailed Sand-Grouse (*Pterocles exustus*) from North Africa, presented by Mr. W. H. St. Quintin; a King Parrakeet (*Aprosmictus cyanopygius*) from Australia, presented by Mr. C. D. Chambers; a Delalande's Gecko (*Tarentola delalandii*) from West Africa, presented by Miss Shenton; a Rhesus Monkey (*Macacus rhesus*, ♂) from India, a Great Kangaroo (*Macropus giganteus*, ♂) from Australia, a Salvadori's Cassowary (*Casuarius salvadorii*), a Blue-necked Cassowary (*Casuarius intensus*) from New Guinea, a Beccari's Cassowary (*Casuarius beccarii*) from South-eastern New Guinea, five Oblong Chelodines (*Chelodina oblonga*) from Australia, a Derbian Sternothere (*Sternothaerus derbianus*) from West Africa, a Blackish Sternothere (*Sternothaerus nigricans*) from Madagascar, two Black-necked Swans (*Cygnus nigricollis*) from Antarctic America, deposited.

OUR ASTRONOMICAL COLUMN.

COMET 1899 *a* (SWIFT).—This comet having now passed considerably to the west of the sun, it is possible that it may be observed in the eastern sky before sunrise. The following ephemeris is given by Herr H. Kreutz in *Astr. Nach.* (Bd. 149, No. 3556):—

Ephemeris for 12*h. Berlin Mean Time.*

1899.		R.A.			Decl.			Br.
		h.	m.	s.	°	′		
May 4	...	23	57	45	... +25	17·9	...	1·74
5	...		53	54	... 26	17·3		1·69
6	...		49	53	... 27	19·3		
7	...		45	41	... 28	24·0	...	1·67
8	...		41	17	... 29	31·5		
9	...		36	40	... 30	42·0	...	1·66
10	...		31	45	... 31	55·7		
11	...		26	28	... +33	12·7	...	1·66

During the week it moves in a north-westerly direction from between Ψ Pegasi and α Andromeda, and is now rapidly decreasing in brightness as it recedes from the sun.

TEMPEL'S COMET (1873 II.). — The following ephemeris is given by M. L. Schulhof in *Ast. Nach.* (Bd. 149, No. 3554):—

Ephemeris for 12*h. Paris Mean Time.*

1899.		R.A.				Decl.				Br.
		h.	m.	s.		°	′	″		
May 4	...	18	48	57·0	...	− 4	42	8	...	0·460
5	...		50	39·5	...	4	37	57		
6	...		52	21·5	...	4	33	51		
7	...		54	3·2	...	4	29	51		
8	...		55	44·5	...	4	25	58	...	0·521
9	...		57	25·5	...	4	22	13		
10	...	18	59	6·0	...	4	18	33		
11	...	19	0	46·1	...	− 4	15	3		

During the week the comet moves slowly north-eastwards through the northern portions of Scutum Sobieski, and should be looked for in the early morning.

SECOND WASHINGTON STAR CATALOGUE.—Appendix I. to the Washington Observations of 1892 has recently been issued, and is devoted to the publication of the catalogue of standard stars which has been compiled from the work done with the transit circle of the U.S. Naval Observatory during the last thirty years. The instrument was made by Pistor and Martins, of Berlin, and was used almost continually from January 1866 to June 1891, being successively under the charge of Profs. Newcomb, Hall, Harkness, and Eastman. Prof. J. R. Eastman, who had the direction of it from 1874 to 1891, has had almost entire charge of the catalogue, and it is therefore issued in his name. Of the 72,914 observations embodied in the book, 17,334 were made by him personally and 39,867 under his immediate supervision.

The first half of the volume is occupied by descriptions of the apparatus and methods of reduction of the observations. Next come the tables of annual results; then a catalogue of stars employed in the American Ephemeris. The general catalogue, with which the book concludes, gives data for 5151 stars, all for the epoch 1875·0.

SPECTRA OF STARS OF CLASS III. *b*.—Prof. W. C. Dunér, of the Upsala Observatory, has been revising his survey of the red stars by means of the new Steinheil refractor, erected there in 1893. This has a visual objective of 36 cm. aperture, and a photographic objective of 33 cm. aperture. All the spectroscopic observations have been made with ocular spectroscopes of the Zöllner type, with dispersions varying from 3°·5 to 10° from C to G (*Astrophysical Journal*, vol. ix. p. 119, 1899).

In most cases, the previous results were confirmed, but in several of the brighter stars of this class he has found additional features. In all the brighter stars the band 5 (λ 576) is seen to be double, while near to the less refrangible edge of band 6 (λ 5636) a bright band is seen. Additional confirmation of the reality of these details is provided by the photograph of the spectrum of 132 Schjellerup in the *Astrophysical Journal*, vol. viii., which clearly shows a bright line at λ 5595. Variations in the relative intensities of the bands are common, notably in the case of bands 6 (λ 5636) and 4 (λ 586). In 152 Schj., the brightest of this class of stars, band 6 and 9 are very bright, while band 4 is quite faint. In 280 Schj. band 4 is the strongest in the spectrum, while band 6 is scarcely visible. Prof. Dunér thinks that, by a closer attention to these variations, a classification of these red stars would be rendered possible.

LEAD COMPOUNDS IN POTTERY GLAZES.[1]

IT has been known for some months that Prof. T. E. Thorpe, F.R.S., and Prof. T. Oliver, had been commissioned by the Home Secretary to investigate the use of lead compounds in the production of pottery glazes and colours, and to suggest means which might be adopted to counteract the evils admitted, on all hands, to follow from their use. It had been found considerably easier by those who had drawn public attention to these evils even to exaggerate them, grave as they were, than to devise remedies which had any chance of practical adoption at the hands of the trade. The scientific eminence of Profs. Thorpe and Oliver, and their practical acquaintance with the details of many manufacturing processes, warranted the opinion that the choice of the Home Office was a wise one. The appearance of their report marks a very welcome stage in the treatment of this troublesome and intricate question. There exists in this country a pottery industry of considerable dimensions, producing pottery wares of infinite variety, and supplying, not merely the demands of our own country, but possessing, probably, a larger export trade than that of any similar industry in the world. This industry has been built up on the practical experience of generations of workers in the same business. The methods in use may appear, in many cases, to be the reverse of scientific; but, at all events, they have sufficed for the production of pottery of excellent make and finish, at a price which enables our potters still to hold their own, in spite of the efforts of their foreign rivals to copy their methods, their shapes, and their designs. It is idle for any one to deny the fact that, for pottery such as forms the bulk of our productions, glazes containing lead compounds are the simplest and the most trustworthy, and best fulfil all the requirements of a difficult and complicated manufacture. It is admitted, however, that lead compounds, used in the form and proportions common in English practice, may, and often do, cause serious illness and suffering—amounting in extreme cases to blindness, paralysis, and death—to those employed in certain of the processes of pottery production. Regulations have been framed from time to time by the Home Office, designed to minimise these evils. The latest proposals of this kind, which came into force only at the end of last year, deal with the removal of dust from work-rooms; the provision of means by which dust containing lead compounds shall be kept from the face of the worker; the provision of overalls and head coverings, as well as adequate and convenient washing accommodation for all workers who come in contact with lead compounds; and last, but by no means least, provide for a compulsory monthly medical examination of all women and young persons employed in certain specified occupations. These regulations, which are set out in full on pp. 43–45 of the report, are in startling contrast with the official regulations in force in foreign countries. While foreign Governments have for the most part either made

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[1] Report to Her Majesty's principal Secretary of State for the Home Department on the employment of Compounds of Lead in the Manufacture of Pottery. By Prof. T. E. Thorpe, LL.D., F.R.S., and Prof. Thomas Oliver, M.D., F.R.C.P.